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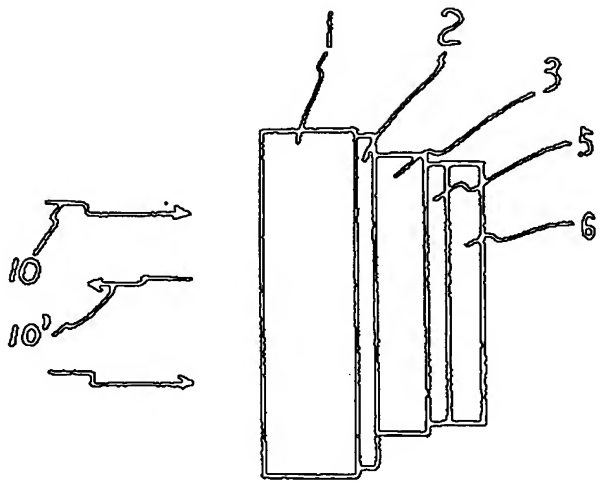
TITLE : MANUFACTURE OF PHOTOELECTRIC CONVERSION SEMICONDUCTOR DEVICE



ABSTRACT : PURPOSE: To improve the conversion efficiency of a photoelectric conversion semiconductor device which uses a nonsingle crystal semiconductor by forming back surface electrodes in a double layer structure of a conductive light transmittance film and a reflecting metal film, thereby preventing the reaction of the metal with the semiconductor.

CONSTITUTION: A light transmittance conductive film (CTF) 2 which mainly contains an SnO_2 is grown in vapor phase on a glass plate 1, a surface layer is particularly formed of P type SnO_2 (10% or less of SbO-addition), and an amorphous layer 3 of Si_xC_{1-x} (where x is 0.7~0.8) is laminated in the order of PIN. The layer 3 is formed by a plasma reaction using SiH_4, SiF_2 at 400°C or lower, or a reduced pressure vapor phase growth with Si_2H_6 at 250~500°C. Further, a CTF5 which mainly contains ITO and 10wt% or less of SnO_2 is accumulated by electron beam deposition or vapor phase grown at approx. 700~2,000Å, thereby preventing the degassing of H_2 or halogen in the layer 3. Then, aluminum or Ag 6 is deposited at 450°C or lower in a thickness of approx. 0.1~2μm to form a reflecting film. According to this configuration, a short wavelength light of 500nm or shorter is absorbed by forth passage, and a long wavelength light is reflected, photocarrier is then generated, thereby improving the conversion efficiency, and deterioration with time does not occur owing to the intermediary of the CTF5.